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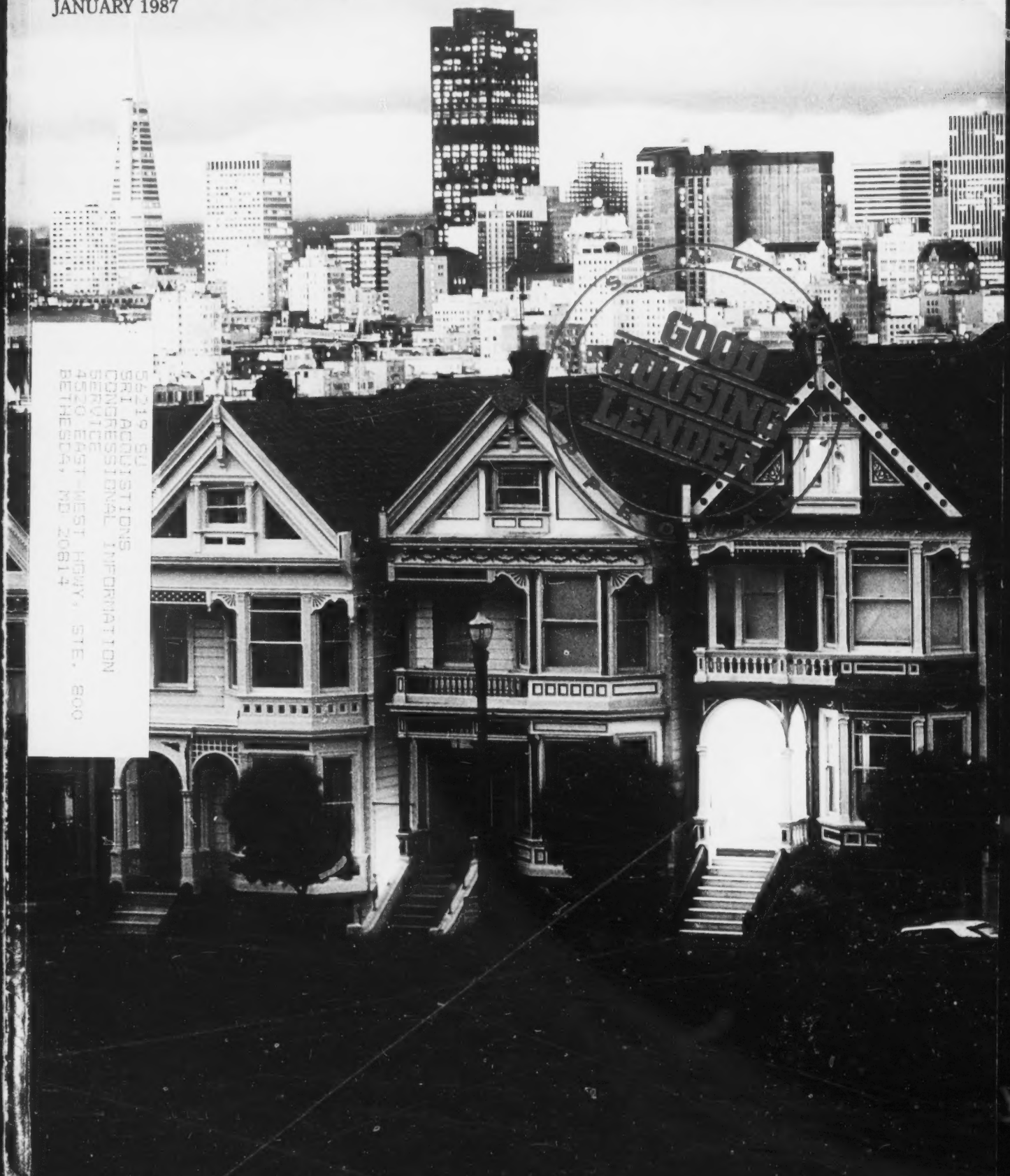
MORTGAGE BANKING

JANUARY 1987



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MORTGAGE BANKING

VOLUME 47 NO. 4
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UNDERSTANDING CMO RESIDUALS

Since first introduced by the Federal Home Loan Mortgage Corporation (Freddie Mac) in June 1983, collateralized mortgage obligations (CMOs) have created the most efficient security structure to date for distributing mortgage cash flow to investors. Since the first issue over three years ago, more than $60 billion of CMOs have been issued by a variety of institutions. Besides Freddie Mac, investment bankers, homebuilders, thrifts, mortgage bankers, insurance companies and real estate investment trusts (REITs) have issued CMOs for a variety of reasons (See Chart 1). CMOs account for approximately 75 percent of all AAA-rated corporate debt issued since mid-1983.

The CMO is an extension of ongoing efforts dedicated to securitizing mortgage cash flow. The cash flow from a collateral pool of mortgage securities or mortgages is the credit support for principal and interest on the bonds. However, the cash flow is allocated to different maturities sequentially. Typically, the last class or "Z-bond" of a CMO issue receives no cash distributions until all earlier classes (generally receiving interest currently) are paid. During this time, the balance of the Z-bond "accretes" or compounds at its coupon rate. After all prior classes are repaid, the Z-bond amortizes based upon its final principal amount. Accordingly, the Z-bond acts like a zero coupon security while the coupon paying classes are outstanding.

Thomas A. Kasper and Les Parker

CMOs revolutionized mortgage investing by offering investors different maturity choices along the yield curve. A typical CMO segments cash flow from 30-year mortgages (or mortgage securities) to create separate bond classes, which may have stated maturities of 5, 10, 20 and 30 years, respectively. However, due to the expected prepayment of underlying mortgage loans, average lives might be 2, 5, 10 and 20 years. These shorter average lives permit pricing off a treasury security with that maturity. Investors can choose the class that fits their desired maturity.

While the CMO provides greater investment certainty, the rating agencies assume a "worst case" scenario in determining the amount that can be borrowed or funded from any particular collateral pool. This amount, or "bond value," is strictly limited so that the CMO is self-supporting under *any* mortgage prepayment or reinvestment rate scenario. The differences between the rating agencies' highly conservative assumptions and actual pricing assumptions produce surplus cash flows or "residuals." These residuals are also called CMO equity when the "owner's trust" structure is used for CMO issuance.

"Owner's trust" CMOs—benefits for mortgage bankers

The differences between the highly conservative assumptions of the rating agencies and the actual CMO pricing assumptions that give rise to the residual cash flows have been analyzed by practitioners since the first CMO was created. The initial focus of the analy-

sis was to determine residual present value under a variety of prepayment and reinvestment rate scenarios. The subsequent focus was to determine the optimal structure for liquification of CMO residuals to improve CMO efficiency.

Under current accounting treatment, CMOs are considered debt obligations when the residual component has a non-trivial present value. Accordingly, CMOs require balance sheet presentation in most instances. This has inhibited a significant number of potential issuers of CMOs; in particular, mortgage bankers. The mortgage banker generally needs asset sale accounting treatment as well as cash "up front" from residual liquification.

Like issuers, buyers of CMOs have their own accounting and investment considerations. To appeal to the largest possible universe of buyers, the CMO residual should qualify under broad real estate and mortgage investment statutes. In addition, the buyer would prefer off-balance sheet treatment of the security, just like the mortgage banker.

In response to some of these problems, Morgan Stanley successfully developed and sold the first issue of CMOs using an "owner's trust" structure. This issue debuted in the November 1, 1985 offering by Morgan Stanley Capital I, a wholly owned affiliate of Morgan Stanley.

The owner's trust structure is functionally identical to other CMO issues in that the bonds are debt obligations. The residuals represent ownership interests in a trust. Just like other CMOs, these residuals result from highly conservative rating agency assumptions required for structuring AAA-rated securities. The owner's trust CMO has, in its short life, become a preferred structure for many issuers. The accounting profession views a sale of residuals as converting a financing to a sale of assets. From an investor's point of view, purchase of less than a 50 percent interest in the CMO equity generally does not require balance sheet treatment of the assets and liabilities of the trust. Importantly, the sale of residuals releases the excess cash flow so that all of the proceeds from the issuance of CMOs are received up front.

The power of the owner's trust CMO results from the ability to securitize and liquify the residual. Buyers of these residuals purchase undivided interests in a trust that owns real estate assets (i.e., mortgages or mortgage securities). For many classes of investors, such as thrift institutions, this form of investment is well understood and established. In particular, residuals represent ideal investments for thrift institutions. They generally have short average lives, superb credit (based on AAA ratings), and high yields. In fact, they even have attractive "defensive" characteristics

CHART 1

CMO Volume By Type of Issuer

($ Billions, Through 9/30/86)

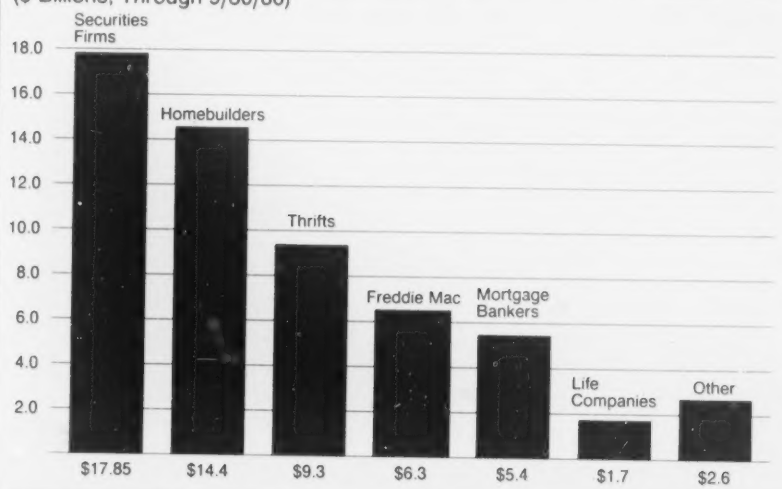
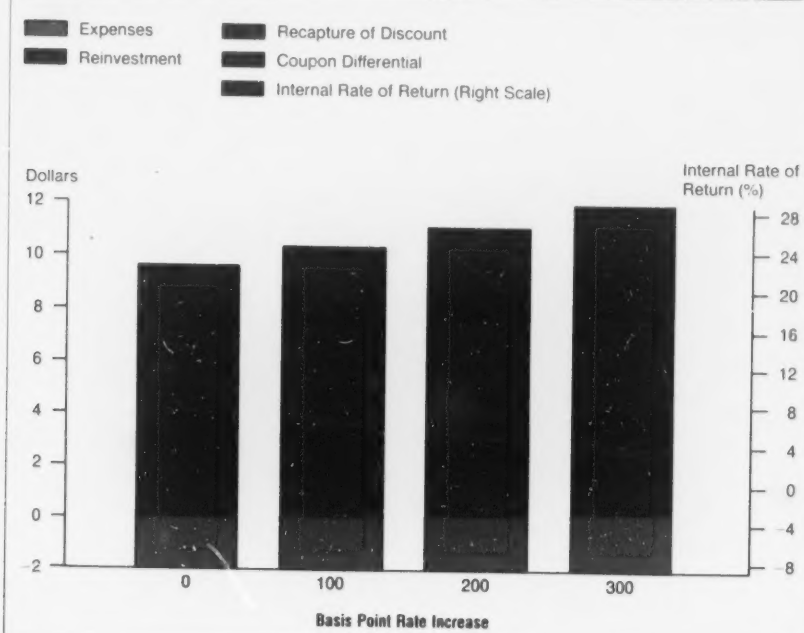


CHART 2

Components of CMO Residuals



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Les Parker, CMB, is vice president and chief operating officer of 1st State Mortgage and Financial Corporation in Austin, Texas.

compared to traditional fixed income securities. Residual investments generally perform better when interest rates are high and mortgage prepayments are low. This is generally the environment when traditional fixed income securities do poorly.

Components of CMO residuals

While residuals have an interest, principal and reinvestment component, it might be instructive to analyze the composition of residuals. Chart 2 sets forth a graphic representation of how the components of CMO residuals will vary with increases in interest rates.

- *Excess interest*—The difference between the highest coupon of the CMO classes and the net rate on premium collateral produces excess yield. The rating agencies assume that premium collateral will prepay immediately; hence, as a practical matter, the maximum bond value is 100 percent of the mortgage's outstanding principal amount. In the case of conventional whole loans, the excess yield is determined at the time of bond pricing when the high CMO coupon is set. The servicing fee is accordingly increased, thus incorporating excess interest into servicing income.
- *Coupon differential*—The difference between the actual CMO coupons and the highest CMO coupon used in calculating bond value. In a typical positive yield curve, the shorter maturity CMOs have lower coupons. This generates interest differential as long as these lower rate CMO classes are outstanding. For example, if a CMO had two classes, one at 9 percent and the other at 8.5 percent, the interest differential would be .5 percent for the actual life of the 8.5 percent class.
- *Recapture of "discount"*—If the net rate of the mortgage collateral is less than the highest CMO coupon rate, the bond value is less than 100 percent of par. Thus, the amount borrowed through the CMO is less than the mortgage loan balance. If the mortgagor prepays in full, the current bond value balance is less than the amount prepaid. For example, assume a $100,000 mortgage secures a CMO with a $95,000 initial bond value. One year later, the mortgagor pays off the loan balance of $99,900. The mortgagee then pays off the outstanding bond value balance of $94,910, creating a recapture of $4,990 in bond value discount. Unless the mortgage never prepays, there is always a difference between the outstanding balance of bonds and mortgages with discount collateral.
- *Reinvestment income*—Most of the funds (mortgage interest, scheduled principal and prepayments) being held for distribution to the bondholders (or for various reserve funds) are invested in guaranteed investment contracts (GICs) or in eligible investments, which include obligations backed by the full faith and credit of the United States government. The difference between the actual income from reinvestment and the assumed reinvestment allowed by the rating agencies when determining the bond value may be a significant component of total residual value, particularly if interest rates are high or rising.
- *Unused reserves and prepaid insurance*—To the extent reserves or insurance are required for the CMO to receive a AAA rating (particularly in the case of whole loans), portions of the reserves may not be used or become unnecessary to ensure the economic viability under the rating agencies guidelines at some future date. For instance, if a mortgage having a buydown reserve balance of $5,000 prepays, the remaining funds accrue to the residual holders.

"REMIC specifically defines and rationalizes the CMO residual."

These are the key components that must be understood in order to model the CMO residual. Before discussing how to model residuals, another issue must be addressed. Who receives the residuals? The issuer of the CMO debt obligation is the initial recipient of all the residuals. Some CMO issues provide for distribution of residual cash flow to an affiliate of the issuer, or utilize the residuals to establish certain reserve funds. Other CMO issues use residual cash flow to accelerate payment to CMO holders.

The cost of administering the CMO is borne by the issuer. The cost of administration includes regular accounting and legal fees to cover various compliance functions, trustee fees for handling the physical mortgage files or securities and the cost of servicing the CMO. Many issuers include an estimate of the administration cost when computing the bond value. Otherwise, bond administration fees are deducted from the residuals. In either case, whenever there are insufficient funds to cover these expenses, the issuer (or purchaser of a residual) may be responsible and can use the residuals available for such expenses. In any case, the rating agencies will review the assumptions behind expenses and bond administration to validate that future shortfalls do not jeopardize the integrity of the CMO issue.

Residual analysis

Residuals must be analyzed on a case-by-case basis. In general, it will be helpful (or necessary) to group collateral by common characteristics in order to capture the impact of different assumptions. For instance, in the universe of Ginnie Mae 9s, remaining terms range from 30 years (new) to approximately 22 years (seasoned). Knowing the specific weighted average remaining terms is important because seasoning affects location on the Public Securities Administration prepayment curve. In general, residual analysis can be viewed as a five-step process:

- Group the CMO collateral by common characteristics (type of mortgage security, coupon, remaining term, etc.)
- Determine reinvestment rates (or guaranteed rate if a GIC is used) for interim cash flows. Monthly mortgage payments will be reinvested prior to distribution to CMO holders on a quarterly or semiannual basis.
- Determine appropriate bond administration expenses that require provisions (unless specifically provided

for in the bond value calculation).
- Generate the net cash flows at different prepayment assumptions.
- Compute the net present value (NPV) and duration of the residual cash flows at different prepayment speeds and discount rates. Most residual analysis is summarized through the internal rate of return (IRR) calculation.

Investment characteristics

Residuals have attractive characteristics to a variety of investors. Four important features are:
- High credit quality (based upon AAA-rated CMOs).
- High yield (versus other securities with comparable duration).
- Short duration (although the cash flows generally have a long "tail").
- Defensive or counter cyclical performance versus other fixed income securities.

> "The CMO is an extension of ongoing efforts dedicated to securitizing mortgage cash flow."

Several of these points need further clarification. Depending upon the shape of the yield curve (and related CMO spreads off the benchmark treasury), the coupon differential is concentrated in the early CMO classes. As mortgages prepay and bonds are retired, this differential is curtailed. Ultimately, the residual may become negative at a crossover point, as certain expenses are assumed to exist for the life of the issue. Calculation of NPV and IRR at various prepayment speeds should incorporate the negative cash

TABLE 3

CMO Economics and Structure (All Dollar Amounts in Thousands)

Bond Information

1)

Class	Par Amount	Percent of Issue	Coupon	Stated Maturity	Average Life		Treasury Yield	Price	Underwriting Fee	Average Life at PSA Speeds: 0%	25%	400%
1	64,479	32.4%	7.800%	11/01/02	3.5	+100 off 3-yr	6.680%	99.909	0.600%	12.4	9.6	1.1
2	56,550	28.4	8.150	11/01/16	5.6	+110 off 5-yr	7.000	99.891	0.600	7.0	5.6	5.6
3	54,772	27.5	9.050	02/01/06	10.9	+185 off 10-yr	7.540	97.669	0.700	17.3	15.3	3.6
4	23,483	11.8	9.550	11/01/16	19.8	+240 off 20-yr	8.200	84.888	0.825	24.4	23.5	12.1
	199,284				10.7			97.518	0.654%			

Residual Information

2)

Prepayment Assumption	Net Investment	PV of Residual at 15%	NPV to Issuer	Rate of Return to Issuer	Rate of Return to Residual Buyer*	Duration of Residual*	Years of Positive Residual
0%	14,558	17,758	3,201	20.14	25.69	3.31	29.00
25%	14,558	16,065	1,507	17.71	23.37	3.21	29.00
50%	14,558	14,550	(8)	14.98	20.68	3.15	28.75
100%	14,558	12,176	(2,382)	9.34	15.00	3.07	27.50
150%	14,558	10,586	(3,972)	4.14	9.75	3.03	25.00
200%	14,558	9,500	(5,058)	N/A	5.03	2.90	22.00
250%	14,558	8,688	(5,869)	N/A	0.14	2.45	18.75
300%	14,558	8,075	(6,482)	N/A	N/A	0.00	16.25
400%	14,558	7,218	(7,340)	N/A	N/A	0.00	12.25

3)

Prepayment Assumption	NPV at 0%	NPV at 5%	NPV at 10%	NPV at 15%	NPV at 20%	NPV at 25%	NPV at 30%	NPV at 35%	NPV at 40%
0%	31,199	17,887	10,294	5,583	2,452	253	(1,362)	(2,591)	(3,556)
25%	23,438	13,526	7,656	3,889	1,310	(545)	(1,935)	(3,011)	(3,866)
50%	17,489	10,000	5,411	2,374	240	(1,330)	(2,528)	(3,471)	(4,229)
100%	9,456	4,987	2,053	0	(1,510)	(2,665)	(3,576)	(4,312)	(4,918)
150%	4,842	1,955	(86)	(1,590)	(2,739)	(3,642)	(4,372)	(4,972)	(5,475)
200%	1,988	11	(1,504)	(2,676)	(3,602)	(4,348)	(4,960)	(5,472)	(5,906)
250%	43	(1,364)	(2,537)	(3,488)	(4,260)	(4,895)	(5,424)	(5,872)	(6,255)
300%	(1,291)	(2,343)	(3,297)	(4,100)	(4,768)	(5,326)	(5,796)	(6,197)	(6,542)
500%	(2,935)	(3,615)	(4,325)	(4,958)	(5,500)	(5,961)	(6,356)	(6,695)	(6,989)

* Assuming purchase of entire residual for $12,176 to yield 15% at 100% PSA.

flows in distant years of the CMO. Although CMO issuers may be able to call any classes still outstanding prior to this crossover point, the rating agencies will not permit an issuer to structure an issue given this assumption.

CMO residuals have a much higher percentage of their total return based upon reinvestment income versus other fixed income securities. Total return is also highly sensitive to prepayment speeds. High interest rates have the dual effect of decreasing mortgage prepayments and increasing reinvestment income. Accordingly, the coupon differential is earned over a longer time period and interim cash flows are reinvested at higher rates. In a high or rising interest rate scenario (i.e., a "bear" market), residuals are an excellent defensive instrument to offset the usual deteriorating performance of traditional fixed income securities. Although discount recapture from principal prepayments would tend to offset this, prepayment of discount mortgages in such an environment would be unlikely.

Table 3 illustrates the interaction of these variables. This exhibit shows the residual analysis (Sections 2 and 3) relating to a specific CMO issue (Section 1). Section 2 sets forth the residual's reaction to prepayment speeds. It is clear that present value and rate of return decline as prepayments accelerate. Also, the number of years of positive residual cash flow is reduced. The matrix in Section 3 illustrates clearly how, in this particular example, higher prepayment speeds erode present value. This would generally be true, even with discount mortgage collateral, since the reinvestment component of total return is so dominant.

Residuals under REMIC

The Real Estate Mortgage Investment Conduit or REMIC structure authorized by the Tax Reform Act of 1986 has already brought significant changes to the mortgage securities market. Several issuers took immediate advantage of REMIC's attractive provisions in late 1986 by pricing offerings to close after the January 1, 1987 effective date. For the first time, issuers will have the option of treating the issuance of multiple class mortgage securities themselves as sales for tax purposes. As a result, REMIC will permit multiple class mortgage security issuers to have the choice of structuring transactions as either financings or sale of assets for accounting purposes without cumbersome tax considerations. This legislation will improve the efficiency of CMO and related mortgage security issues.

REMIC specifically defines and rationalizes the CMO residual. The market liquidity and investor base for residuals will undoubtedly increase. As a defined security, residuals have increased status and reduced tax and legal investment uncertainty. The specific REMIC provisions which enhance the legal and tax status of residuals are:

- Residuals under REMIC, unlike owner's trust residuals, are freely transferable.
- Residuals are now treated as qualifying mortgage assets for purposes of the special bad debt reserve deduction for thrifts.
- Residuals are qualifying real estate assets for REITs.
- Residual income is partially tax-exempt to pension plans whereas income from owner's trust residuals falls under the unrelated business taxable income rules.
- Without minimum equity requirements needed to satisfy debt tests for tax purposes, residuals can be structured more efficiently.

Mortgage bankers will undoubtedly be significant issuers of mortgage securities under REMIC. REMIC addresses the mortgage banker's two greatest stumbling blocks in creating mortgage securities: obtaining asset sale accounting treatment and maximizing cash proceeds. Efficiently structured residuals can qualify more readily for asset sale treatment under financial reporting requirements. Greater liquidity and a broader investor base will facilitate residual sales and maximize cash proceeds. Understanding mortgage cash flows and the rating agency considerations employed in structuring AAA-rated securities can proceed without tax distractions. Analysis of all the cash flows and their permutations will permit liquification beyond the highly conservative assumptions of the rating agencies. The result will be maximum capital market efficiency. □

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MORTGAGE MARKET TRENDS

Economic statistics released during the first two weeks of December suggest that the expected strengthening of the economy during the fourth quarter is underway. At the time of this writing (mid-December), Mortgage Bankers Association (MBA) economists believe that real gross national product (GNP) should increase at an annual rate of 3 to 3½ percent during the final three months of 1986, up from a revised 2.9 percent during the July-through-September period. However, this strengthening is largely the result of temporary factors and is very likely to be followed by a weakening economy during the first half of the new year. Under such circumstances, we anticipate further declines in interest rates through the middle of 1987, helped along by at least one cut in the Federal Reserve's discount rate. Indeed, it appears that this decline in interest rates has begun, with long-term rates down roughly 20 basis points from the relatively stable levels of November.

Economic indicators released during late October and the first half of November were mixed and raised some doubt as to whether or not a fourth-quarter strengthening would materialize. However, data released in late November and the first half of December suggest that this strengthening is indeed occurring. Non-agricultural payroll employment rose by a healthy 250,000 during November after having increased by 260,000 in October. These increases included gains in manufacturing of 35,000 in November and 23,000 in October. Moreover, average weekly hours also increased in November, resulting in a significant increase in aggregate hours worked. In fact, at an annual rate, the index of aggregate weekly hours of production or non-supervisory workers on private non-agricultural payrolls for October and November was up 3 percent above the average level for the third quarter. Retail sales in November rose a moderate 0.5 percent above the October level. Spending for goods other than autos rose 0.9 percent compared to 0.3 percent in October. Moreover, domestic auto sales increased during the last 10 days of November, probably induced by the change in tax law which takes effect January 1.

Activity in the one- to four-family housing area is holding up reasonably well. Starts of one- to four-family units in October were up 2.6 percent above the September level while single-family resales maintained their pace of nearly 3.8 million units. The multifamily area, however, continues to be plagued by both high vacancy rates and pending tax reform with starts declining 7 percent further to 462,000 units. Building permits issued declined moderately in October for both one- to four-family units and multifamily units.

Price statistics recently have been less favorable than they were earlier in the year, when declines in energy prices were large enough to produce an overall reduction in prices of both producer-finished goods and consumer goods and services. Nonetheless, nothing worrisome has developed on the inflation front. In October, producer prices of finished goods other than food and energy rose 0.7 percent, but this rather large increase stemmed partly from the introduction of 1987 models of domestically-produced cars and light trucks. In November the increase in this index declined to 0.3 percent, returning to the moderate rate of increase of earlier months.

For the first half of 1987, MBA economists expect economic growth to slow to around a 2-percent annual rate. Consumer spending will be markedly slower than in the first three quarters of 1986, as the personal savings rate increases to more normal levels. Commercial building outlays should begin declining again relatively soon, and are expected to continue dropping throughout most of next year. Reduced growth in federal expenditures, reflecting congressional efforts to restrain spending, will also act in the short run to slow down overall economic expansion. Rising net exports and increased inventory investment are expected to be sources of strength next year, but not enough to induce a significant pickup in the overall pace of expansion. Indeed, auto inventories have risen substantially since the end of September, and have already led to moderate cutbacks in auto production.

There is no reason to expect major new developments regarding inflation in the near term. Import prices have been increasing a bit faster recently, but not enough to put major upward pressure on domestic inflation. The OPEC countries have now adopted a price objective of $18 a barrel. Achievement of that objective, however, will require production cuts that may not be acceptable to individual OPEC countries. Even if a price of $18 a barrel could be made to stick, it is unlikely that the underlying inflation rate would break out of the 3- to 4-percent range in evidence recently. Wage rate increases are likely to remain comparatively low in an environment of slow to moderate growth while competitive pressures in product markets are expected to remain fierce.

Growth in the 2- to 3-percent range will be less than Federal Reserve officials are likely to view as satisfactory. With inflation remaining under good control, the dollar having strengthened recently and the Japanese discount rate having been reduced, the Fed has leeway to take additional easing steps if they choose to. Additional easing actions will be taken once it becomes fully evident that the improvement in the pace of expansion since mid-1986 has been of modest dimensions. Such evidence should be in hand before the end of the first quarter of next year, if not earlier.

It would not be surprising to see two additional cuts in the Federal Reserve's discount rate before the middle of 1987. If this occurs, short-term interest rates will fall by a full percentage point. Long-term rates would likely decline considerably less, by perhaps half a percentage point. Nonetheless, this would bring conventional mortgage rates down to the 8½- to 9-percent level by the middle of 1987.

Such a decline in mortgage interest rates should help to hold single-family house sales and housing starts near current levels through most of the year. Specifically, MBA economists expect one- to four-family housing starts to range around 1.25 million next year while single-family resales should stabilize in the 3.25- to 3.5-million range. Multifamily starts, however, are expected to decline further, probably to around 400,000 units in 1987. □

Richard W. Peach
Senior Economist
December 15, 1986

HOUSING ACTIVITY

RESIDENTIAL STRUCTURES, BY UNIT TYPE

(Units in thousands)

YEAR AND MONTH	HOUSING STARTS: Actual Total	HOUSING STARTS: Actual 1-4 Units	HOUSING STARTS: Actual 5+ Units	HOUSING STARTS: Seasonally Adjusted Annual Rates Total	HOUSING STARTS: Seasonally Adjusted Annual Rates 1-4 Units	HOUSING STARTS: Seasonally Adjusted Annual Rates 5+ Units	PERMITS 17,000 ISSUING PLACES: Actual Total	PERMITS 17,000 ISSUING PLACES: Actual 1-4 Units	PERMITS 17,000 ISSUING PLACES: Actual 5+ Units	PERMITS 17,000 ISSUING PLACES: Seasonally Adjusted Annual Rates Total	PERMITS 17,000 ISSUING PLACES: Seasonally Adjusted Annual Rates 1-4 Units	PERMITS 17,000 ISSUING PLACES: Seasonally Adjusted Annual Rates 5+ Units
1986												
JUN	184	132	52	1,852	1,310	542	173	121	52	1,792	1,229	563
JUL	172	122	50	1,782	1,218	564	165	115	50	1,759	1,196	563
AUG	164	117	47	1,795	1,275	520	144	100	44	1,673	1,147	526
SEP	154	108	46	1,664	1,161	503	152	103	49	1,603	1,144	459
OCT	155	109	46	1,628	1,171	457	145	103	43	1,565	1,109	456
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1985 TOTAL	1,742	1,166	576				1,733	1,077	657			
1984 TOTAL	1,750	1,206	544				1,682	1,065	617			
11 MONTHS												
1986	1,693	1,185	508				1,624	1,101	523			
1985	1,621	1,094	527				1,606	1,010	596			
1984	1,616	1,093	523				1,575	1,005	570			
1983	1,595	1,112	483				1,497	970	527			

RESIDENTIAL STRUCTURES BY REGION

(Units in thousands)

YEAR AND MONTH	STARTS: Actual North East	STARTS: Actual Mid-West	STARTS: Actual South	STARTS: Actual West	STARTS: Seasonally Adjusted Annual Rates North East	STARTS: Seasonally Adjusted Annual Rates Mid-West	STARTS: Seasonally Adjusted Annual Rates South	STARTS: Seasonally Adjusted Annual Rates West	PERMITS 17,000 ISSUING PLACES: Actual North East	PERMITS 17,000 ISSUING PLACES: Actual Mid-West	PERMITS 17,000 ISSUING PLACES: Actual South	PERMITS 17,000 ISSUING PLACES: Actual West	PERMITS 17,000 ISSUING PLACES: Seasonally Adjusted Annual Rates North East	PERMITS 17,000 ISSUING PLACES: Seasonally Adjusted Annual Rates Mid-West	PERMITS 17,000 ISSUING PLACES: Seasonally Adjusted Annual Rates South	PERMITS 17,000 ISSUING PLACES: Seasonally Adjusted Annual Rates West
1986																
JUN	30	35	70	48	283	300	768	501	28	30	66	50	274	286	728	504
JUL	28	34	64	45	270	336	705	471	30	31	61	43	314	297	692	457
AUG	34	30	60	40	321	293	707	474	25	28	52	39	272	289	653	459
SEP	29	27	61	37	280	270	702	412	30	28	53	41	297	258	597	451
OCT	27	28	60	41	250	238	678	462	27	27	52	40	260	249	598	458
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1985 TOTAL	252	240	782	468					260	237	753	484				
1984 TOTAL	204	243	866	436					201	212	812	457				
11 MONTHS																
1986	275	276	693	449					264	272	634	454				
1985	235	227	726	453					242	220	690	453				
1984	190	232	815	413					186	200	760	430				
1983	159	207	873	357					153	179	806	360				

HOUSING ACTIVITY (Cont'd.)

YEAR AND MONTH	HOUSING SALES (Units in thousands) EXISTING HOUSES[1]	NEW HOMES Sold	NEW HOMES Available For Sale	NEW HOMES Months Supply at Current Rate	VALUE OF NEW CONSTRUCTION PUT IN PLACE (Dollars in billions) Seasonally Adjusted Annual Rate Total	1 Unit	2+ Units	Non-res.	CONSTRUCTION STATUS (Units in thousands) Seasonally Adjusted Annual Rate Under Construction Total	1-4 Units	5+ Units	Completions Total	1-4 Units	5+ Units
1986														
MAY	330	75	336	5.3	224.3	99.5	32.9	91.9	1,132	648	484	148	94	54
JUN	338	66	340	5.8	226.7	102.4	32.8	91.5	1,153	665	488	150	103	47
JUL	336	57	349	6.1	229.5	104.4	32.6	92.5	1,157	675	482	151	101	50
AUG	341	52	354	7.0	232.5	105.5	32.5	94.5	1,164	682	482	159	109	50
SEP	317	60	359	5.9	232.1	106.6	31.8	93.7	1,154	678	476	157	112	45
1985 TOTAL	3,214	688										1,703	1,167	534
1984 TOTAL	2,868	639										1,652	1,137	515
10 MONTHS														
1986	3,027	652										1,434	980	454
1985	2,847	590										1,398	956	442
1984	2,484	559										1,369	939	430
1983	2,337	529										1,127	819	308

LENDER ACTIVITY

LONG-TERM MORTGAGE LOANS CLOSED
By Type of Institution and By Unit Type
(Dollars in millions)

YEAR AND MONTH	TOTAL Total	Mtg. Bankers[9]	S&Ls	Banks[2]	Life Cos.	1-4 UNITS Total	Mtg. Bankers[9]	S&Ls	Banks[2]	Life Cos.
1986										
JAN	24,806	5,488	10,512	7,428	1,378	17,341	5,168	7,693	4,126	154
FEB	28,203	5,835	10,478	9,983	1,907	18,980	5,326	8,157	5,418	79
MAR	34,748	8,906	13,190	10,211	2,441	25,767	8,134	10,348	6,944	341
APR	43,754	10,037	15,811	15,490	2,416	31,838	9,443	12,705	9,375	315
MAY	50,363	12,534	18,630	16,485	2,714	38,365	11,821	15,793	10,497	254
1985 TOTAL	369,343	68,065	145,372	127,873	28,033	241,474	62,658	109,286	68,224	1,306
1984 TOTAL	295,062	50,816	129,482	97,776	16,988	199,228	47,589	96,187	54,626	826
6 MONTHS										
1986	239,773	57,049	90,581	77,779	14,364	177,399	52,855	73,356	49,840	1,348
1985	154,435	27,409	64,260	51,319	10,477	101,481	25,544	48,224	27,322	391
1984	150,808	30,460	64,836	47,948	7,564	102,450	25,410	48,992	27,645	403
1983	126,145	33,860	44,644	41,714	5,927	89,407	28,390	35,322	25,338	357

LENDER ACTIVITY (Cont'd.)

LOANS CLOSED (Cont'd.)

(Dollars in millions)

YEAR AND MONTH	5+ UNITS					NONRESIDENTIAL				
	Total	Mtg. Bankers[9]	S&Ls	Banks[2]	Life Cos.	Total	Mtg. Bankers[9]	S&Ls	Banks[2]	Life Cos.
1986										
JAN	1,790	86	1,218	433	53	5,675	234	1,401	2,869	1,171
FEB	2,335	323	1,099	541	372	6,888	186	1,222	4,024	1,456
MAR	2,216	300	1,278	447	191	6,765	472	1,564	2,820	1,909
APR	2,478	404	1,305	416	353	9,438	190	1,801	5,699	1,748
MAY	2,541	489	1,363	508	218	9,420	224	1,474	5,480	2,242
1985 TOTAL	28,034	2,396	15,604	7,262	2,772	99,835	3,011	20,482	52,387	23,955
1984 TOTAL	20,588	443	13,160	5,519	1,466	75,246	2,784	20,135	37,631	14,696
6 MONTHS										
1986	13,009	2,676	7,843	2,975	1,515	49,365	1,518	9,382	26,964	11,501
1985	11,337	1,009	6,654	2,808	866	40,617	856	9,382	21,189	9,190
1984	11,829	1,830	6,427	2,861	711	36,529	3,220	9,417	17,442	6,450
1983	9,643	2,990	3,710	2,475	468	27,095	2,480	5,612	13,901	5,102

LONG-TERM COMMITMENT ACTIVITY

By Type of Institution

(Dollars in millions)

YEAR AND MONTH	ISSUED DURING MONTH					OUTSTANDING				
	Total	Mtg. Bankers[9]	S&Ls	Banks[2]	Life Cos.	Total	Mtg. Bankers[9]	S&Ls	Banks[2]	Life Cos.
1986										
JAN	$26,031	$7,695	$12,913	$3,000	$2,423	$ 96,650	$13,930	$47,353	$18,327	$17,040
FEB	31,132	7,954	13,907	6,680	2,591	108,898	16,153	44,355	30,732	17,658
MAR	42,995	14,666	17,787	6,118	4,424	124,558	23,110	50,614	31,625	19,209
APR	47,297	12,715	21,823	8,751	4,008	137,435	27,712	53,917	35,033	20,773
MAY	61,486	9,883	23,380	22,858	5,365	160,521	24,409	56,406	56,531	23,175
1985 TOTAL	323,085	59,986	170,763	60,635	31,701					
1984 TOTAL	258,986	44,893	146,184	47,065	20,844					
6 MONTHS										
1986	259,843	65,568	112,989	59,193	22,093					
1985	114,552	23,236	78,155	28,305	14,856					
1984	141,883	27,390	77,593	25,650	11,250					
1983	126,101	43,390	56,024	18,114	8,573					

MORTGAGE INSURANCE

(Units in thousands, Dollars in millions)

YEAR AND MONTH	APPLICATIONS RECEIVED (Units)				LOANS INSURED							
	Total	FHA[3]	VA	Private	Total		FHA(203)		VA		Private	
					Units	Amt.	Units	Amt.	Units	Amt.	Units	Amt.
1986												
MAY	344	220	39	85	141	9,837	73	4,608	24	1,742	44	3,487
JUN	314	166	48	100	138	9,904	56	3,530	32	2,397	50	3,977
JUL	320	166	42	112	153	10,878	64	3,971	27	1,942	62	4,965
AUG	265	128	44	93	191	13,197	95	5,840	37	2,657	59	4,700
SEP	274	141	51	82	191	13,095	82	4,805	48	3,467	61	4,823
1985 TOTAL	2,194	902	251	1,041	1,261	83,305	338	19,784	192	13,046	731	50,475
1984 TOTAL	1,862	477	180	1,205	1,344	86,775	200	10,644	198	12,728	946	63,403
10 MONTHS												
1986	2,866	1,696	376	794	1,403	97,202	639	39,158	274	19,695	490	38,349
1985	1,858	744	202	912	1,040	68,498	268	15,630	148	10,006	624	42,862
1984	1,592	378	169	1,045	1,175	75,859	181	9,620	172	11,022	822	55,217
1983	1,690	680	295	715	1,066	63,857	322	16,282	237	14,920	507	32,655

SECONDARY MARKET ACTIVITY

(Dollars in millions)

YEAR AND MONTH	FNMA Portfolio Comm.	FNMA Portfolio Purc.	FNMA Mortgage-Backed Securities Outstanding	FNMA Mortgage-Backed Securities Issued	FHLMC* Comm. to Sell	FHLMC* Comm. to Buy	FHLMC* Mtg. Purc.	FHLMC* Mtg. Sold	GNMA Pass-Through Securities Applications	GNMA Pass-Through Securities Issued
1986										
MAY	$3,538	$1,978	$67,312	$4,491	$9,857	$10,612	$8,947	$8,162	$4,863	$5,872
JUN	3,049	3,000	72,377	6,831	9,720	10,338	10,505	10,353	9,472	8,178
JUL	3,270	3,343	76,197	6,106	8,585	7,863	8,518	8,118	14,246	10,226
AUG	3,840	3,800	81,060	7,079	12,722	13,707	10,458	10,127	10,177	6,813
SEP	4,248	4,649	86,359	7,357	n.a.	n.a.	n.a.	n.a.	36,333	12,861
OCTp	3,375	3,784	90,573	4,506	n.a.	n.a.	n.a.	n.a.	8,358	11,021
1985 TOTAL	20,225	21,510	—	23,649	44,085	46,762	44,012	44,085	64,360	45,868
1984 TOTAL	21,006	16,721	—	13,546	30,743	32,601	21,885	20,489	36,101	27,857
10 MONTHS										
1986	29,905	25,942	—	49,437	66,726	70,866	58,255	55,821	129,215	76,434
1985	17,168	18,224	—	15,587	27,988	31,569	26,802	24,088	52,873	36,098
1984	16,099	13,463	—	9,903	17,153	18,166	11,380	10,451	29,927	24,355
1983	16,139	14,006	—	11,108	21,815	23,168	14,831	14,119	62,033	44,096

* FHLMC Year-to-date totals are for eight months only.

INTEREST RATES AND YIELDS

YEAR AND MONTH	1- to 4-UNIT MORTGAGES: FHA OPINION SURVEY FHA New[4]	FHA OPINION SURVEY CONVENTIONAL New	FHA OPINION SURVEY CONVENTIONAL Existing	FHLBB SURVEY CONVENTIONAL New	FHLBB SURVEY CONVENTIONAL Existing	FNMA 1 Yr. ARM (1%/Yr.)	FNMA FRM Conv.	APARTMENTS[5]
1986								
JUN	9.98%	10.38%	10.39%	10.15%	10.20%	8.60%	10.050%	11.62%
JUL	10.01	10.28	10.32	10.30	10.26	8.29	9.813	12.02
AUG	9.80	9.88	9.92	10.26	10.26	7.96	9.455	11.45
SEP	9.90	9.96	9.95	10.17	10.08	7.86	9.588	12.16
OCTp	9.80	9.89	9.85	10.02	9.97	7.75	9.425	12.09
NOVp	9.8	9.8	9.8	9.95	9.85	7.75	9.340	11.94

YEAR AND MONTH	CURRENT SECONDARY MARKET YIELDS GNMA[6]	FNMA[6]	FHLMC[6]	SELECTED SECURITIES A-Rated[7] Utility	U.S. Government 10-yr.	U.S. Government 26-wk.	Prime Comm. Paper 90-119 Days
1986							
JUN	9.57%	9.71	9.75	9.65%	7.80%	6.27%	6.71%
JUL	9.32	9.48	9.49	9.57	7.30	5.86	6.33
AUG	9.11	9.21	9.24	9.51	7.17	5.55	5.92
SEP	9.28	9.27	9.32	9.56	7.45	5.35	5.68
OCT	9.05	9.14	9.18	9.48	7.43	5.26	5.68
NOVp	9.1	9.2	9.2	9.51	7.53	5.42	5.65

SPREADS (Basis Points)

YEAR AND MONTH	FHA New Minus A-Utility	GNMA Minus 10-Yr. Govt.	FNMA Minus 10-Yr. Govt.	FHLMC Minus 10-Yr. Govt.
1986				
JUN	41	177	191	195
JUL	50	202	218	219
AUG	29	194	204	207
SEP	34	183	182	187
OCT	49	162	171	175
NOVp	45	145	155	155

NA—Not available. p—Preliminary.

[1] From the National Association of Realtors "Existing Home Sales" series.

[2] Mutual Savings Banks and Commercial Banks.

[3] FHA applications received includes the Direct Endorsement Program starting in 1984.

[4] Secondary market gross yields.

[5] Federal Home Loan Mortgage Corp. Existing Construction only.

[6] Securities for 0 to 30 day delivery.

[7] Prior to January 1984 this rate was for Aaa-rated New Issue Utility Bonds.

[8] Year-to-date seasonally adjusted series not calculated.

[9] 1985 data on mortgage bankers obtained from the HUD Survey of Mortgage Lending Activity.

MORTGAGE BANKING

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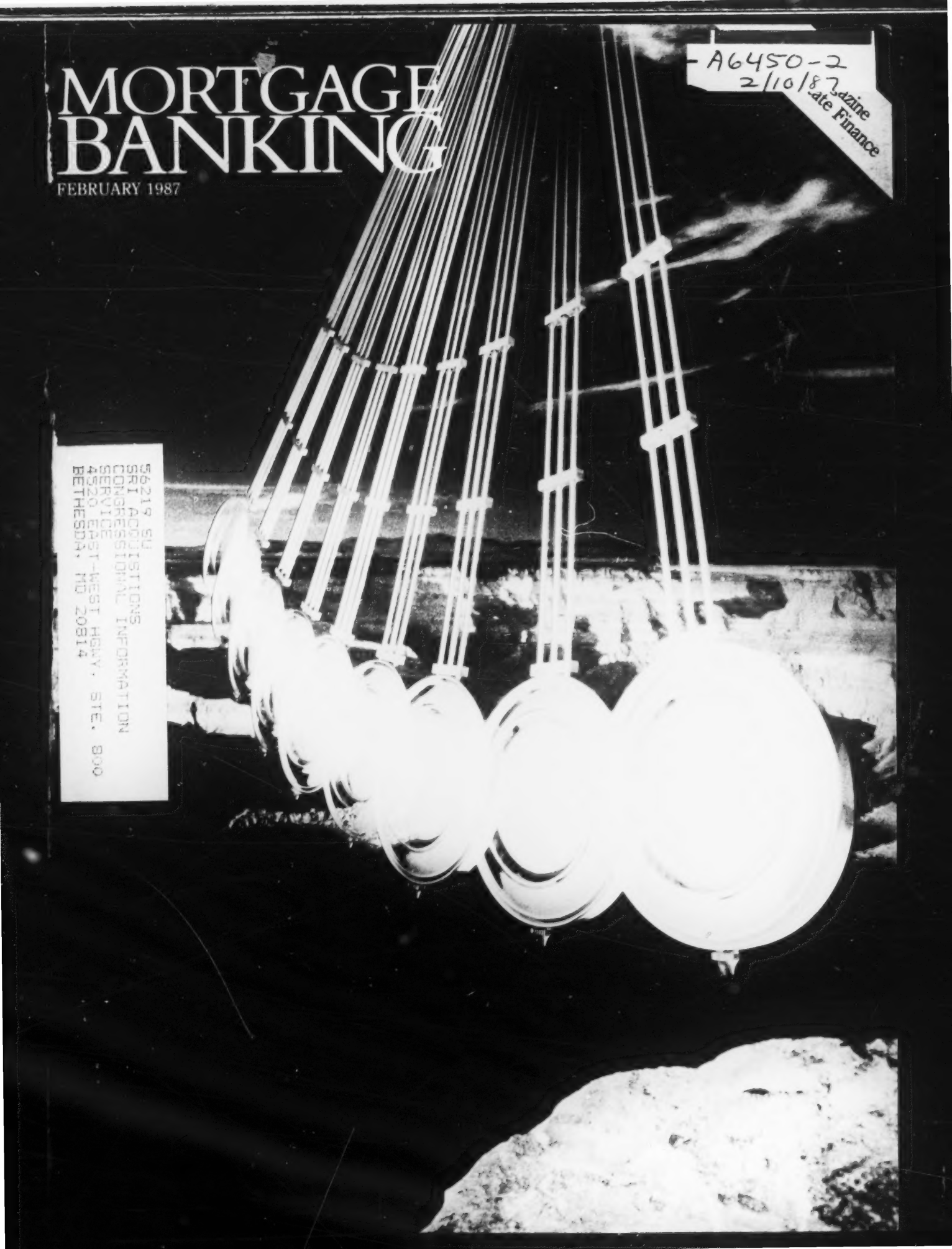

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MORTGAGE BANKING

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MANAGING INSURED RISK: WHICH WAY WILL THE PENDULUM SWING?
Roger F. Blood
This article examines the mortgage insurance industry from an underwriting, risk management, marketing and service-responsive standpoint. Will the industry experience a further swing of the pendulum, either to a more conservative extreme, or back toward a more accommodating posture? The author identifies the forces operating to warrant further changes.

PAGE 22
MORTGAGE INSURANCE: GEARING UP FOR NEW CHALLENGES
William H. Lacy
The mortgage insurance industry is responding to a changing environment. MIs are trying to leave behind the adverse effects of unprecedented claims levels in the early 1980s and are preparing to face the new challenges ahead. MGIC's president outlines his company's goals.

PAGE 31
MARKET LEADERSHIP THROUGH GROWTH MANAGEMENT
Diane L. Cortes
This author believes that growth management for the real estate finance industry will require a deliberate slowing in the acceptance of new business in the short run. However, some lenders will be unwilling to sacrifice short-term profits for long-term benefits. The opportunity to achieve market leadership will be open to those who choose to manage their growth, according to this article.

PAGE 39
SUPERFUND: LENDER LIABILITY
Robert A. Weissman
Lenders face potential liability for hazardous waste found on property financed through mortgage loans. Today counsel to lenders must be well-versed in environmental law as well as real estate law.

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FHA-MI: A MARKETPLACE PERSPECTIVE
Brian Chappelle
During 1986, FHA had its greatest year ever. According to this article, FHA received approximately 2 million applications surpassing all previous records by more than 50 percent. The MIs' competition with FHA should be decided in the marketplace and not by OMB. As long as the marketplace decides, the American homebuyer will benefit.

PAGE 55
HOW MOODY'S RATES MIs
Michael F. Molesky
This article details Moody's approach to rating mortgage default insurance. Data from 1985 seem to indicate that because of tighter underwriting standards, it may be the best first-year performance in more than 14 years.

PAGE 73
PRICING MORTGAGE INSURANCE FOR ADEQUATE RETURN: TERRITORIAL RATING
Jeffrey L. Kucera
PMI has established rate differences by state. It also introduced a major change in 1986 with the performance incentive program. This program is a form of experience rating where a lender is offered a discount based on its better than average experience. PMI believes that territorial rating and the performance incentive program are major steps forward in the pricing of mortgage insurance.

PAGE 78
THE ECONOMIC AND FINANCIAL OUTLOOK FOR 1987
Lyle E. Gramley
MBA's chief economist, Lyle E. Gramley, presents *Mortgage Banking's* annual economic forecast. It does not seem likely that the economy will emerge from the relatively moderate growth path that has been in existence since mid-1984. Gramley predicts that the economy will grow at around a 2½ percent rate during the four quarters of 1987.

PAGE 89
1986: A YEAR OF NEW RISK
Anthony W. Schweiger
Meridian Mortgage Corporation's executive vice president overviews some of the major developments in the mortgage banking industry during the past year.

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AN INTERVIEW WITH JOE C. MORRIS
The new chairman of the U.S. League shares some of his plans for the coming year in this exclusive interview with *Mortgage Banking* magazine.

PAGE 100
BUSINESS BASICS MORTGAGE PROTECTION SERVICE
C. Richard Hughes
This article explains what the different types of real property-related insurance are. Customers may have one or more of these coverages and understanding what they are and how they differ will help the customer know what protection he or she currently has.

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How Moody's Rates MIs

Mortgage insurance (MI) is a highly specialized industry. The MI companies' product, mortgage default insurance, stands in sharp contrast to all other insurance products. Mortgage defaults are influenced not only by random events, which disrupt borrower income, but also by adverse regional and national economic conditions. The normal loss cycle for these companies is considerably longer than that for property casualty products and is directly related to the housing market and general business cycle. Yet, the fundamental risk that this insurance is intended to cover, namely, national economic catastrophe, is what sets the industry apart from all other types of insurance and necessitates very special analysis. ■ Given the unusual fundamental risk to be covered, the use of traditional measures to assess an MI company's potential success or failure in meeting all potential claims is doomed. Reviews of trends in loss and expense ratios, risk-to-capital ratios simply do not provide enough information to assess

ILLUSTRATION BY DENNIS WALSTON AND MARIT GRETZ

Michael F. Molesky

how such companies would perform under stress. One approach used by many analysts is to assume that loan performance would mirror what was experienced in the 1930s depression. However, such assumptions ignore several important considerations:

- The information available from the 1920s and 1930s is limited to those concerns that survived the Depression. Foreclosure frequencies and losses may have been higher for the many companies that failed.
- Today's financial market is of a very different structure from the 1930s with deposit insurance and a Federal Reserve. There are also ancillary federal agencies specifically set up to assist the mortgage market. In addition, the welfare system is capable of substantially softening a major decline in the economy.
- Today's loan instruments are sharply different from loans in the 1930s. Such loans tended to be short-term loans with balloon payments which had to be refinanced to avoid foreclosure—a difficult feat during a period of failing financial institutions. The lack of available financing had a decided impact on foreclosure rates of the early 1930s.
- There are substantial differences in the inherent credit risk of loans by type, loan-to-value (LTV) and location—all of which vary from one company to another. To ignore such differences and apply standard performance assumptions to each company would result in little differentiation in each company's ability to perform.

Moody's approach to rating the claims paying ability of private mortgage insurers entails an extensive, in-depth examination of the individual operations of each company. In addition, Moody's applies a very unique approach to qualifying the risks associated with a company's risk exposure. The firm's history of risk management and its experiences are examined in light of the interaction of the loan portfolio's risk characteristics and economic forces over time.

To do this requires an on-site visit with key management officials. An initial meeting will often cover the following topics:

Michael F. Molesky is an assistant vice president for the structured transactions group within the corporate department of Moody's Investors Service in New York City.

> "Original loan-to-value has been a particularly sensitive measure of relative risk because it delineates the degree to which the borrower has a stake in the property, especially in the early years of the loan."

The company corporate structure

- Structure and company position
- Strategic planning and outlook
- Non-insurance activities
- Management experience

Operating strategy and results

- Principal lines of business and products
- Distribution systems and marketing
- Commission structures
- Competition
- Management control
- Underwriting standards, pricing
- Profitability

Reserves

- Reserving policies
- Management and actuarial control
- Reserve evaluation, loss experience, adequacy testing

Investments

- Investment policies and strategies
- Coordination with risk exposure
- Portfolio quality
- Portfolio performance

Taxation

- Company's tax position, including presence of deferred taxes, tax carryforwards or carrybacks
- Intercompany tax treaties; transfer or sale of tax benefits

Reinsurance ceded and assumed

- Strategies for use of reinsurance
- Underwriting policies
- Major amounts ceded and assumed companies
- Risk exposure limitations and control

This intense interview session fills in the missing links needed to more fully understand the changes in the company's financial statements. Moody's collects all of a company's annual financial statements and computerizes key sections of it. A cash flow model unique to the company's operations will be developed from the combined information.

Moody's recognizes distinct differences in the performance of individual MIs because of different risk portfolios and exposure to different local economic influences. Over half of the industry developed during an economic era which was conducive to unusually low default rates. It is necessary to separate out the influences of price appreciation and other market factors to truly understand how a company might operate under different economic stress situations, especially under extreme economic conditions. Therefore, Moody's develops a loss model which qualifies the risks unique to a company and which can project losses under a variety of economic conditions. Most importantly, the model development requires only assumptions about economic conditions. Moody's does not make any assumptions about foreclosure frequency or loss severity. These components of loss are derived from the loss model.

Moody's loss models

As an essential part of its rating process, Moody's requires that a company provide unpublished data on a special matrix tape format: Originations, insurance, and risk-in-force by 10 or more different loan types, by four loan-to-value groups, by year of origination, and by state or U.S. territory. Moody's also requires a set of data referred to as the claims-survivorship data, also by loan type, occupancy status, loan-to-value, year of origination and state. These data track the number of loans outstanding by year of origination and

depict claim terminations by risk class and year in which they occur and the average claim, net of salvage.

Moody's uses the data, together with information about local economies over time, to model the claim terminations by occupancy status, loan type and loan-to-value. By this means, Moody's can describe an economic stress in terms of economic conditions and allow the performance of the individual firm to dictate the frequency of default and loss severity it might suffer, should such a scenario actually occur.

For companies with little experience in a particular loan type, industry models are substituted to avoid forecasting errors due to insufficient degrees of freedom. However, with each annual update, there is a multiple increase in the number of degrees of freedom because the data are arranged by year of origination and four loan-to-value groups. Consequently, most companies will have sufficient observations for individual loan-type models within a few years. Presently the most accurate, individual company loss models are those for the standard fixed-payment conventional loan.

Losses incurred, losses paid and risk outstanding, as projected by the loss model, are meshed with the cash flow model to test the adequacy and quality of the company's own reserves as well as the adequacy of support arrangements and enhancements. Thus the operations of a company, the strengths of its investment portfolio and the amount of risk and quality of risk taken on by the company, together with any enhancement arrangement are viewed on their own merits in the face of economic stress. Through the detailed process, Moody's is essentially reunderwriting the company's book of business.

Claims-paying ability

Moody's puts the company through two stress scenarios in order to evaluate the firm's claims-paying capacity: first, a depression-like scenario, and second, a stagflation scenario that is meant to stress the performance of adjustable rate mortgage (ARM)-type mortgages, which have swiftly become a major component of the industry's risk exposure. These tests emphasize not only the company's individual capacity to pay claims but also the sufficiency of additional enhancements or guarantees.

> "Net equity position, over time, has been established as the key determinant of default probability by several studies of Federal Housing Administration (FHA) data and has been confirmed for conventional loans by other researchers using loan data from MGIC."

Depression stress test

Moody's uses a depression stress test as an important tool to test the claims-paying capacity of a company's resources plus enhancements. Through the use of the modeling approach, Moody's imposes no assumption on the company's performance, but rather lets the company performance models interact with economic forces comparable to those that characterized the last depression in determining the company's claim frequency and loss severity and remaining outstanding risks. These estimates, when injected into the cash flow model, determine how well the company is able to pay all claims and remain solvent.

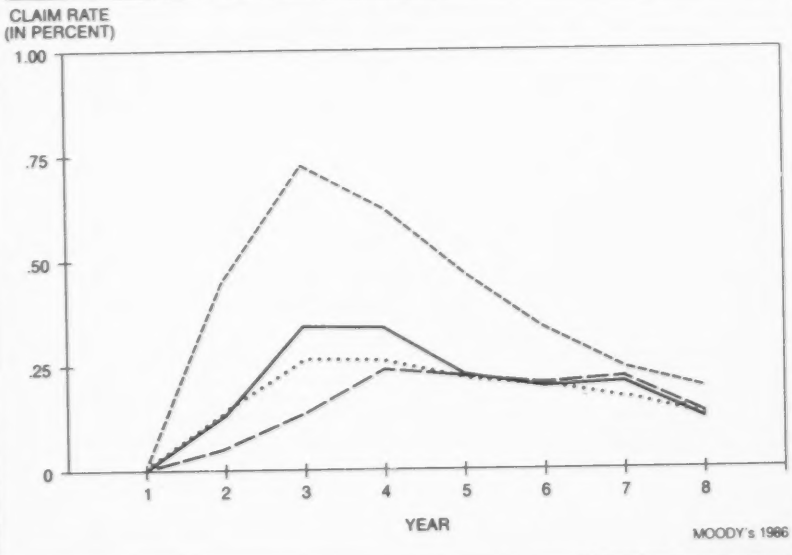
We describe an eight-year depression scenario that attempts to match known economic influences. Key factors are listed in Table 2 for national averages.

Under the depression scenario, Moody's assumes that, with home prices falling sharply, mortgage insurance companies would cease writing new insurance, preferring to wait until the market turned around. Precedents for cessation of new business in certain local markets abound from recent experience. Some firms have stopped writing new insurance in cities such as Houston, while others have suspended operation in whole states, such as Wyoming and Alaska.

Moody's attention to the mortgage insurance industry is an ongoing concern. As the fortunes of various local markets change, and as the companies add new policies while existing ones mature, the capacity of individual companies to pay claims changes. More-

GRAPH 1

EVER TO DATE CLAIM RATES
ALL LOAN TYPES
1957-1977



over, with each year, there is more performance information available to assess the potential risks inherent in the newer mortgage loan instruments. To stay abreast of changing market conditions and trends, Moody's reviews the financial statements of each company on a quarterly basis. On an annual basis, Moody's runs a full review which includes the collection and analysis of the detailed data base used in the formulation of the loss model. Some of this previously unpublished data is available in Moody's annual and quarterly updates on the industry.

Appendix risk analysis

Detailed analysis of risk exposure is a key process in Moody's evaluation of the mortgage insurance industry. It is essential in measuring the relative strengths and weaknesses of the major firms in the industry. A mortgage insurance company's risk exposure reflects the combination of many different elements, all of which relate directly to the net equity position of loans within a portfolio and/or the ability to meet scheduled changes in monthly payments. Major risk elements include the following:

- Geographic dispersion of business;
- Loan-to-value mix;
- Type of loan instrument and loan characteristics;
- Occupancy status; and, most important,
- Relative price appreciation on the underlying collateral for loans insured, usually associated with the relative age of the loan portfolio.

Geographic location

Location of property is a particularly important element. Local economic conditions affect the probability of default of an individual loan more than the national economy does. Consequently, the greater the geographic distribution of a firm's risk exposure, the less chance there is that purely random local economic dislocations will greatly affect its performance.

Perfect geographic distribution (with all other things being equal) would imply a distribution in proportion to the observed distribution of all private residences. However, localities are not equal in their vulnerability to economic dislocation. Default statistics by state indicate that some states have had consistently higher default rates, and others have had consistently lower ones. However, very few states are prolonged good or bad performers. A firm's performance could be improved if it concentrated in areas which exhibit greater economic diversification. Such diversification reduces an area's vulnerability to swings in the business cycle of individual industries.

The mortgage insurance industry pattern has been to follow expanding local market areas, because lower default rates are often associated with economic expansion, growing land values and house prices. However, boom markets, like the Houston housing market in the late 1970s, sometimes fall upon hard times. Thus, the traditional method of managing risk, of spreading out risk exposure as best one can, remains the optimal long-run strategy. (See Table 3 for state performance during 1980-1985.)

Loan-to-value and net equity

Original loan-to-value has been a particularly sensitive measure of relative risk because it delineates the degree to which the borrower has a stake in the property, especially in the early years of the loan. The higher the

GRAPH 2

EVER TO DATE CLAIM RATES
ALL LOAN TYPES
1978-1985

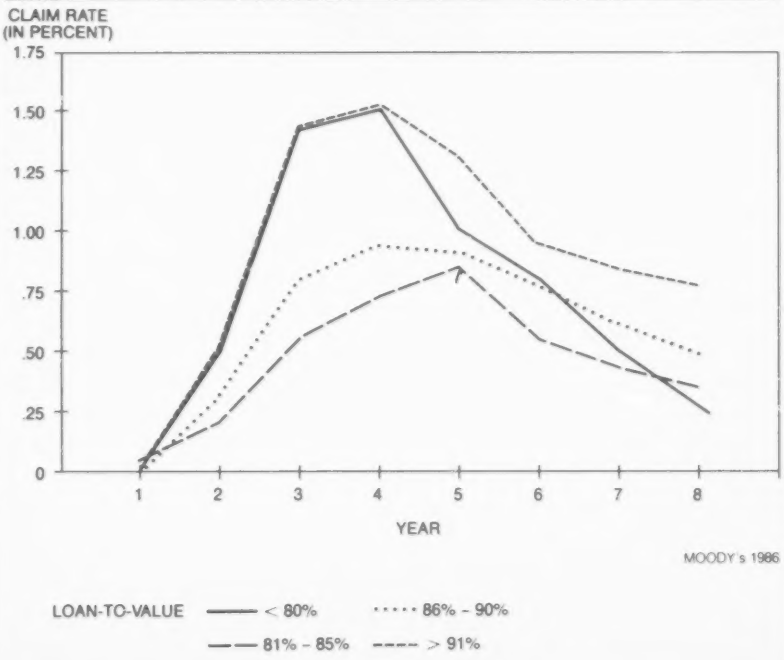


TABLE 2

Moody's Depression Scenario
Assumptions for the U.S. Economy

Scenario Year	Home Price Change	Rate of Unemployment	Long-term Interest Rates	30-Day Cost of Money
1	0.00%	12.00%	10.00%	8.00%
2	−10.00	14.00	8.50	7.00
3	−10.00	20.00	7.50	6.00
4	−10.00	25.00	6.25	4.00
5	−10.00	22.00	5.00	3.00
6	0.00	20.00	5.00	3.00
7	1.50	18.00	5.00	3.00
8	3.00	16.00	6.00	4.00
9	3.00	14.00	6.00	4.00
10	3.00%	12.00%	7.00%	5.00%

TABLE 2A

Geographic Distribution of Primary Direct Risk in Force Comparisons By Regions and Ten Largest States, as of December 31, 1985

	UGRIC		GEMICO (OH)		MGIC (new)		PMI		VEREX		WMAC (old MGIC)		Foremost		Industry Averages	
	State	%	State	%	State	%	State	%	State	%	State	%	State	%	State	%
	CA	19.3	CA	11.7	CA	7.6	CA	25.0	CA	12.2	CA	12.5	CA	18.2	CA	15.3
	TX	9.6	FL	10.7	TX	6.8	TX	15.1	FL	8.2	TX	11.6	NY	12.4	TX	10.7
	FL	8.7	TX	9.7	OH	6.8	WA	7.5	TX	7.4	FL	6.0	NC	9.9	FL	7.3
	NY	3.5	AZ	5.1	MA	5.5	FL	5.1	NY	6.1	MI	4.2	MI	8.1	VA	3.6
	SC	3.5	OH	5.1	MI	5.0	CO	4.0	IL	3.8	IL	3.4	TX	7.0	IL	3.1
	LA	3.2	VA	4.9	WI	4.5	MD	3.8	PA	3.8	OH	3.3	PA	5.1	NY	3.0
	VA	3.0	NC	4.4	IL	4.0	IL	3.6	NJ	3.7	KS	3.0	NJ	5.1	MD	2.9
	NC	2.6	GA	4.0	NJ	3.8	GA	3.2	KS	3.6	MD	3.0	GA	5.0	OH	2.8
	OH	2.6	MA	3.7	FL	3.3	NC	3.0	MN	3.4	PA	2.8	FL	5.0	PA	2.8
	WA	2.6	MD	3.2	MO	3.3	VA	2.9	OK	3.0	NJ	2.8	MN	4.9	NC	2.7
Ten State Totals		58.6		62.7		50.6		73.2		55.1		52.6		80.7		54.2
By Region																
North East		9.9		11.0		21.5		8.3		17.1		14.3		25.7		13.3
N. Central		15.3		19.5		32.4		12.6		22.0		24.9		19.2		19.0
South		37.8		47.9		30.5		37.6		38.5		37.6		30.0		41.2
West		35.3		21.6		15.6		41.3		22.0		22.7		25.1		26.1
U.S. Territory		1.7		0.0		0.0		0.0		0.4		0.5		0.0		0.4
Non-U.S.		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
Total		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0

	TMIC		CMAC (consol.)		GEMICO (NC, CA, FL)		HOME		IMI		Integon		RMIC		Industry Averages	
	State	%	State	%	State	%	State	%	State	%	State	%	State	%	State	%
	CA	21.1	CA	16.3	NC	13.5	VA	57.6	CA	29.4	GA	38.5	NC	19.0	CA	15.3
	TX	16.9	PA	11.3	TX	8.5	MD	10.9	NY	5.9	TX	17.9	FL	12.8	TX	10.7
	FL	8.8	TX	11.1	CA	8.0	PA	9.1	CO	5.7	FL	12.4	TX	10.2	FL	7.3
	VA	7.1	FL	10.2	FL	8.0	FL	7.4	WA	5.3	PA	5.3	GA	6.8	VA	3.6
	MD	5.4	NJ	9.8	LA	4.6	TX	5.8	FL	5.2	TN	3.2	VA	6.3	IL	3.1
	CO	3.3	GA	7.7	GA	4.4	NC	2.3	OH	4.4	VA	2.8	SC	6.0	NY	3.0
	MA	3.1	VA	6.8	VA	4.1	TN	1.9	TX	4.4	NC	2.5	CA	5.4	MD	2.9
	GA	3.1	MA	5.8	OK	3.5	DC	1.6	IL	3.5	SC	2.2	MD	4.8	OH	2.8
	IL	3.0	MD	5.5	MD	3.4	DE	0.7	MA	3.1	KY	1.7	AL	4.6	PA	2.8
	OH	2.3	TN	3.1	PA	3.3	SC	0.5	OK	2.8	IL	1.5	MO	4.0	NC	2.7
Ten State Totals		74.2		87.7		61.3		97.9		69.7		88.0		80.1		54.2
By Region																
North East		8.3		28.6		4.5		9.7		16.7		7.9		2.1		13.3
N. Central		12.2		1.3		16.3		0.3		13.5		4.3		8.9		19.0
South		47.8		51.2		63.4		89.6		23.4		85.4		79.3		41.2
West		31.8		18.9		15.8		0.5		46.3		2.5		9.7		26.1
U.S. Territory		0.0		0.0		0.0		0.0		0.1		0.0		0.0		0.4
Non-U.S.		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
Total		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0

down payment, the less the likelihood is that the borrower will walk away from the loan. In order to examine the relative risk of loans by original loan-to-value and compare the experience of firms over time and under various economic situations, Moody's has requested and received claims-survivorship data by loan type, loan-to-value, occupancy status and year of origination from the nine largest firms in the industry. Three firms currently account for more than 90 percent of private mortgage insurance in force.

Based on ever-to-date claim rates for combined company data sets, the graphs presented reflect the general experience of the MI industry on more than 11 million loans classified by loan-to-value. The graphs have been separated into two multiyear groups of books of business: loans insured between 1957 and 1977 and loans insured between 1978 and 1985. The data represent the weighted average claim termination frequencies by policy year. For example, the first-year claim frequency equals the number of all first-year claims divided by the total number of originations, while for each successive year, claim frequencies are derived by dividing the number of all claims that year by the total number of loans outstanding at the beginning of the policy year.

These graphics are intended to show the impact of net equity on claim termination frequencies. In both sets of graphics, claim frequencies tend to get smaller as the loans grow older. This is generally associated with the growth in the net equity position of the loans. Net equity is defined as the market value of the home less the outstanding balance of the loan, interest due and the transaction costs of selling the property. While loan balances are paid down over time, early principal payments are quite small for several years. Consequently, most of the early growth in net equity is due to market value appreciation.

Net equity position, over time, has been established as the key determinant of default probability by several studies of Federal Housing Administration (FHA) data and has been confirmed for conventional loans by other researchers using loan data from MGIC. Moody's has reaffirmed these conclusions using its own model of default probability, based on a larger data

Table 3

Direct Losses Paid as a Percent of Previous End-of-Year Risk by State and U.S. Territory

State	1980	1981	1982	1983	1984	1985	1980-1985 Weighted Averages
Alabama	0.19%	0.26%	0.38%	0.77%	0.56%	0.79%	0.55%
Alaska	0.36%	0.18%	0.02%	0.04%	0.16%	0.78%	0.31%
Arizona	0.04%	0.23%	0.43%	1.04%	1.37%	1.12%	0.84%
Arkansas	0.11%	0.17%	0.26%	0.39%	0.41%	0.58%	0.36%
California	0.04%	0.20%	0.59%	1.36%	1.40%	1.07%	0.97%
Colorado	0.06%	0.16%	0.27%	0.86%	1.11%	1.87%	0.99%
Connecticut	0.11%	0.26%	0.43%	0.56%	0.31%	0.14%	0.28%
Delaware	0.24%	0.23%	0.28%	0.20%	0.24%	0.26%	0.24%
Wash., D.C.	0.21%	0.10%	0.21%	0.44%	0.33%	0.27%	0.27%
Florida	0.08%	0.10%	0.36%	1.05%	1.66%	1.42%	1.07%
Georgia	0.14%	0.18%	0.36%	0.42%	0.34%	0.34%	0.31%
Hawaii	0.00%	0.06%	0.31%	0.85%	1.21%	1.35%	0.74%
Idaho	0.10%	0.24%	0.47%	0.87%	0.56%	0.80%	0.59%
Illinois	0.22%	0.47%	0.75%	1.15%	1.19%	1.12%	0.88%
Indiana	0.25%	0.44%	0.84%	1.15%	1.07%	1.07%	0.84%
Iowa	0.34%	0.64%	1.31%	1.80%	1.67%	1.46%	1.27%
Kansas	0.25%	0.36%	0.55%	1.06%	1.20%	1.13%	0.88%
Kentucky	0.27%	0.47%	0.58%	0.82%	0.65%	0.80%	0.64%
Louisiana	0.04%	0.08%	0.11%	0.36%	0.73%	1.13%	0.54%
Maine	0.46%	0.64%	0.75%	0.84%	0.48%	0.28%	0.53%
Maryland	0.19%	0.16%	0.25%	0.31%	0.33%	0.44%	0.31%
Massachusetts	0.16%	0.12%	0.23%	0.20%	0.06%	0.08%	0.12%
Michigan	0.12%	0.34%	0.77%	1.64%	1.27%	0.79%	0.84%
Minnesota	0.06%	0.11%	0.24%	0.48%	0.68%	0.83%	0.51%
Mississippi	0.13%	0.26%	0.50%	0.69%	0.75%	2.22%	0.88%
Missouri	0.37%	0.53%	0.95%	1.11%	0.74%	0.59%	0.70%
Montana	0.17%	0.59%	1.24%	1.14%	1.21%	1.10%	0.92%
Nebraska	0.24%	0.42%	0.94%	1.44%	1.28%	1.32%	1.00%
Nevada	0.05%	0.19%	0.67%	1.11%	1.81%	2.23%	1.27%
New Hampshire	0.13%	0.21%	0.45%	0.46%	0.28%	0.06%	0.24%
New Jersey	0.17%	0.18%	0.25%	0.87%	0.54%	0.89%	0.61%
New Mexico	0.04%	0.05%	0.15%	0.34%	0.55%	0.51%	0.34%
New York	0.67%	0.45%	0.40%	0.35%	0.19%	0.18%	0.29%
North Carolina	0.18%	0.20%	0.35%	0.41%	0.43%	0.27%	0.31%
North Dakota	1.07%	1.09%	1.91%	2.49%	2.78%	2.44%	2.02%
Ohio	0.45%	0.71%	1.35%	1.80%	1.42%	1.01%	1.14%
Oklahoma	0.20%	0.22%	0.18%	0.55%	1.00%	1.99%	0.92%
Oregon	0.11%	0.26%	0.93%	2.66%	2.20%	2.55%	1.54%
Pennsylvania	0.42%	0.46%	0.69%	0.81%	0.54%	0.60%	0.58%
Rhode Island	0.36%	0.47%	0.85%	0.49%	0.30%	0.26%	0.42%
South Carolina	0.13%	0.18%	0.37%	0.41%	0.35%	0.52%	0.37%
South Dakota	0.43%	0.84%	1.55%	1.11%	1.50%	1.52%	1.20%
Tennessee	0.16%	0.35%	0.71%	0.84%	0.59%	0.76%	0.59%
Texas	0.10%	0.14%	0.26%	0.74%	1.21%	2.31%	1.07%
Utah	0.20%	0.69%	1.41%	1.14%	1.74%	1.83%	1.36%
Vermont	0.05%	0.25%	0.31%	0.80%	0.55%	0.42%	0.45%
Virginia	0.13%	0.18%	0.31%	0.30%	0.45%	0.49%	0.35%
Washington	0.05%	0.14%	0.55%	1.14%	1.60%	1.36%	0.98%
West Virginia	0.27%	0.62%	0.79%	1.29%	1.31%	1.15%	1.00%
Wisconsin	0.25%	0.56%	1.07%	1.46%	1.24%	1.18%	1.02%
Wyoming	0.05%	0.18%	0.32%	2.07%	4.23%	6.06%	2.71%
Guam	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Puerto Rico	1.60%	1.23%	0.86%	0.76%	0.53%	0.58%	0.91%
Virgin Islands	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total	0.18%	0.28%	0.50%	0.90%	1.01%	1.12%	0.78%

Notes: 1. Data exclude losses paid and risk in force of US Mortgage Insurance Company for all the above years. Investors Mortgage Insurance for years 1980 to 1984 and Republic Mortgage Insurance Company for 1985.

2. Ratios were calculated as direct losses paid as a percent of the previous end-of-year direct risk in force.

3. 1980-1985 weighted averages represent total direct losses paid over the period divided by the sum of each previous year's risk in force.

base representing all of the MIs it reviews.

The separation of the graphs by two time periods is intended to show that the inflation-induced net equity positions of the 1970s were clearly responsible for keeping MI claim termination rates so low (see Graph 1). Claim frequencies generally peaked in the third policy year for all loan-to-value categories, falling off gradually as net equity improved through repayment of principal and, more importantly, through increased market value of the property.

In Graph 2, claim terminations were markedly higher over the 1978-1985 period. While record postwar unemployment rates in 1981 and 1982 certainly contributed to the high default rates in those years, the principal cause was the very low level of home price appreciation nationally and the actual decline in home prices in many areas of the country. These same areas have suffered unusually high levels of claim frequencies, even as the economy moves into its fourth year of economic recovery. Also note that claim frequencies have not peaked in the third policy year but have tended to peak in the fourth or fifth. Moreover, claim frequencies have not declined appreciably, because home price appreciation has remained low since 1981. Moody's analysis of the MI claim data suggests that if future home price appreciation remains as low as the National Association of Realtors projects during the next decade, relatively unseasoned loans as well as all new high loan-to-value loans insured will continue to incur high default rates during the next several years.

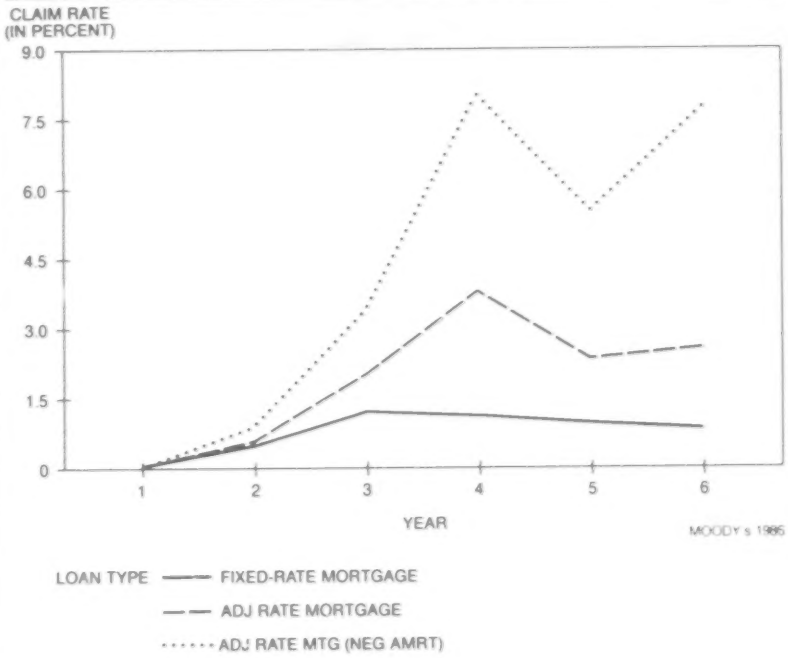
Occupancy status

Occupancy risk is another major category for differentiating risk. Vacation homes and investor homes, taken together, have had more than twice the frequency of default and markedly higher average claim amounts than owner-occupied home loans. Investors homes, alone, have proven to be more than four times as risky.

Investor loans account for a large percentage of privately insured less than 81 percent loan-to-value loans, ranging from 33 percent to 53 percent of such loans (except for new MGIC, whose new policy standards exclude investor loans). There are far fewer

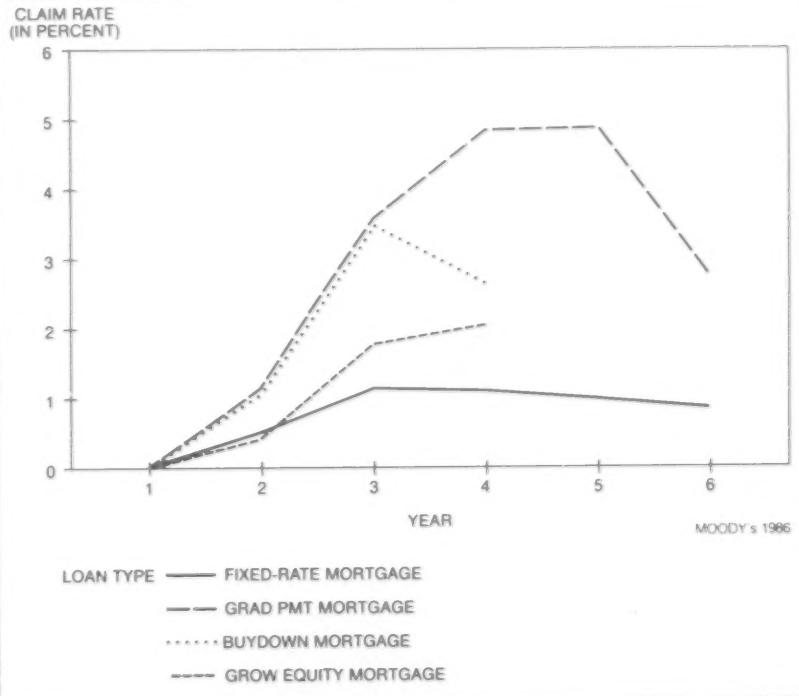
GRAPH 3

EVER TO DATE CLAIM RATES
LOAN TYPE COMPARISON
LOAN-TO-VALUE > 91%
1980-1985



GRAPH 4

EVER TO DATE CLAIM RATES
LOAN TYPE COMPARISON
LOAN-TO-VALUE > 91%
1980-1985



investor loans as the loan-to-value category gets higher. There is also a heavier concentration of such loans in ARMs, graduated payment mortgages (GPMs), and other alternative mortgage instruments designed to keep earlier year monthly payments lower than would be the case for fixed-rate, fixed-payment mortgages.

The adverse insured investor-loan experience suffered by the mortgage insurance companies, Fannie Mae and Freddie Mac has resulted in substantial underwriting changes with regard to such loans. Most firms will now only agree to 20 percent down loans, with closer screening of information and substantially higher insurance premiums. Before long, insured investor loans may become a thing of the past. They are not a large portion of any mortgage insurance portfolio, running from 3 percent to about 10 percent of total risk exposure on the individual companies, and about 7 percent of the industry's total risk exposure.

Risk by loan instrument

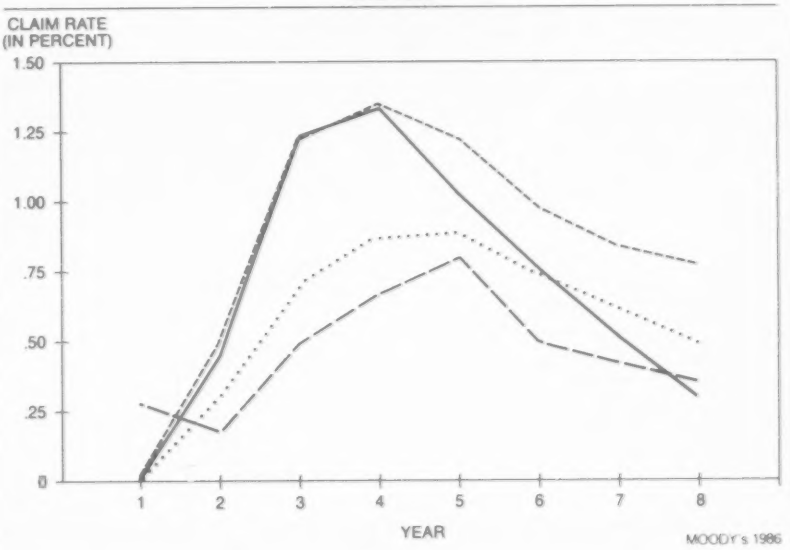
The claim frequencies presented in Graph 2 were greatly affected by the experience of new types of mortgage instruments insured by the industry whose full risk potential was unknown at the time of their introduction. Development of new types of loan instruments has introduced new elements of risk, some aspects of which are speculative in nature and cannot be actuarially defined. These instruments were originally designed to address the issue of housing affordability. By 1979, high interest rates and continued home price inflation had made homeownership difficult for many first-time homeowners. Adjustable rate mortgages were later introduced, not only to reduce early year interest costs, but also to provide intermediaries with a reduction in interest rate risk.

Differences in loan types affect both the borrower's equity position and his ability to make payments. Payments on normal, fixed-rate conventional loans are level, with speed of principal repayment determined by the coupon rate and the term to maturity. As long as a homeowner maintains employment and incurs no additional debt, his ability to meet monthly payments will not likely be affected. Many of the new loan instruments involve scheduled or potential changes in monthly payments. Such loan instruments assume that a borrower's income will increase over time at some minimum growth rate to meet the planned or unplanned adjustments to monthly payments.

Examples of the various loan types and their effect on payments and net equity vary considerably. Most graduated payment mortgages have fixed interest rates but schedule payment increases, as well as planned limited negative amortization, in the early years of the mortgage. Growing equity mortgages (GEMs) have no negative amortization but do have scheduled payment increases, which rapidly increase the borrower's equity position.

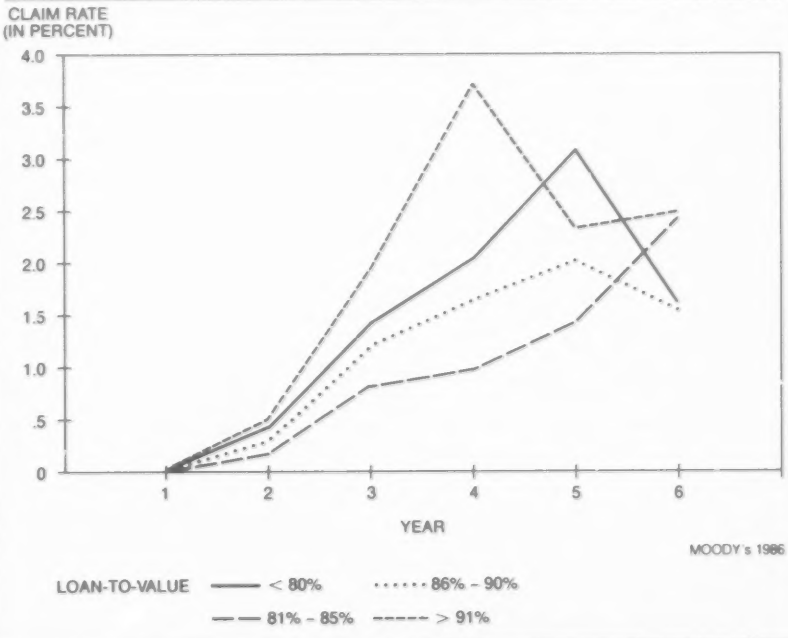
GRAPH 5

EVER TO DATE CLAIM RATES
FIXED-RATE MORTGAGES
1978-1985



GRAPH 6

EVER TO DATE CLAIM RATES
ADJUSTABLE RATE MORTGAGES
1980-1985



Builder buydowns were introduced to reduce monthly payments in the early years of loans. Depending upon the size of the buydown, monthly payments increase to full regular payments within one to three years. Quite often, the cost of buydowns is recaptured in the price of the home, distorting the true initial loan-to-value ratio.

ARMs potentially can include all of these characteristics, depending on what loan features have been adopted for a particular loan. The variety of features in ARMs makes this particular instrument difficult to assess and to track over time. However, there has been a marked trend toward greater standardization in ARM instruments, which will improve Moody's ability to assess the risk exposure presented to mortgage insurers.

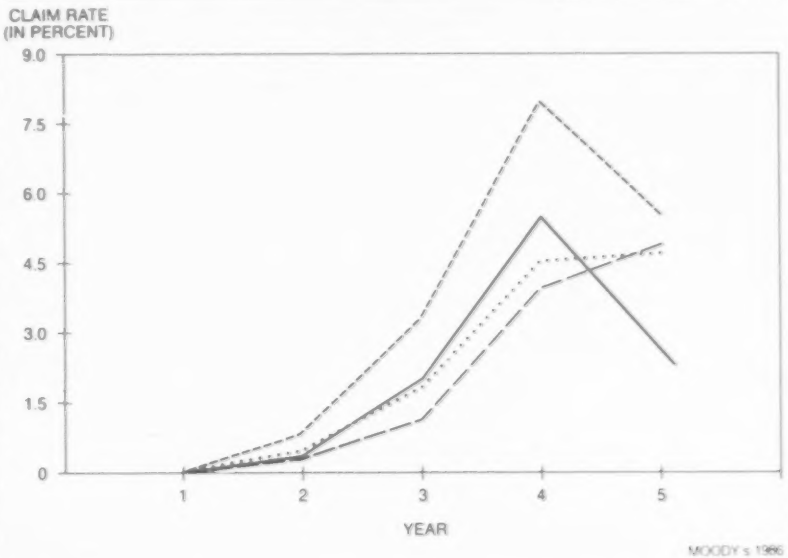
In the graphics, the claim termination rates of fixed-rate, fixed-payment mortgages (FRM) are compared with sets of claim rates of non-conventional loan types for the 91 percent to 95 percent loan-to-value group. Except where noted, the claim experience is for loans originated between 1980 and 1985. Data for 1985, for the sixth policy year, should be considered preliminary, because only the largest companies had reported 1985 claims-survivorship results at the time this article was prepared. However, given the relative market share of these companies and the number of loans represented, the sixth-year results presented should be considered to have only a very small degree of potential error. Moody's will provide fully updated figures in a future report on the industry.

In Graph 3, the 1980-1985 default experience of 5 percent down, fixed-rate, fixed-payment loans is compared with fully amortizing adjustable rate mortgages that permit or schedule negative amortization. Compared with fixed-rate, fixed-payment mortgages, fully amortizing ARMs were more than twice as likely to default, with 5 percent down ARMs that permit negative amortization were 4.8 times as likely to default. More important, these differences arose over a period—especially in policy years three through six—when interest rates were falling. Should such loans be faced with a period of rising interest rates, the additional payment shock and the squeeze on net equity permitted by negative-amortizing ARMs could push claim rates on such mortgage instruments to even higher levels.

Graph 4 compares fixed-rate, fixed-payment mortgages with graduated payment mortgages, growing equity mortgages and mortgages with temporary buydowns. The experience for both buydowns and GEMs is limited, however, both instruments display claim frequencies that are higher than fixed-rate mortgages and can only be attributed to payment shock. What is quite surprising is that the buydowns very nearly approximate GPM experi-

GRAPH 7

EVER TO DATE CLAIM RATES
NEGATIVE AMRT MORTGAGES
1981-1985



GRAPH 8

EVER TO DATE CLAIM RATES
GRADUATED PMT MORTGAGES
1980-1985